Injecting insulin through clothing was safe and convenient


Objective
To assess the safety of injecting insulin through clothing.

Design
20-week randomized cross-over trial.

Setting
University hospital diabetes clinic in Michigan, United States.

Patients
50 patients who had diabetes mellitus requiring insulin and had been injecting insulin for ≥ 1 year. 42 patients (84%) (mean age 41 y, 50% women, 78% insulin-dependent diabetes mellitus) with a mean duration of diabetes of 14 years completed the study.

Intervention
Patients were allocated to a method of injecting insulin through clothing or to the conventional method in which the skin had to be wiped with alcohol and allowed to dry before injecting the insulin. Patients proceeded with their injection method allocation for 10 weeks and then switched to the alternate method for another 10 weeks. All injections were done in the thighs. Injections through clothing could only be done through 1 layer of fabric; a written list of fabric options was provided. Patients recorded information about injections in daily logs and noted benefits and problems.

Main outcome measures
Leukocyte count, differential count, and glycosylated hemoglobin levels were compared at baseline, 10 weeks, and 20 weeks. The problems (blood, bruising, pain, and infection) and benefits (saves time, convenience, less noticeable, and less awareness) associated with the 2 methods recorded in the daily logs were compared.

Main results
The groups did not differ for leukocyte count (P = 0.30), neutrophil count (P = 0.14), or glycosylated hemoglobin level (P = 0.63). No patients reported adverse skin reactions. The mean number of recorded problems per day did not differ between groups. A mean of 0.32 problems/d was reported with the conventional method of injection compared with 0.40 problems/d with injections through clothing (P = 0.19). A greater mean number of benefits was recorded with injecting insulin through clothing compared with the conventional method (1.34 vs 0, P < 0.01). The written comments of participants indicated that injecting insulin through clothing was more convenient and did not increase bleeding or bruising at injection sites.

Conclusion
Injection of insulin through clothing was as safe as, and more convenient than, the conventional injection technique requiring skin preparation.

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For article reprint: D.R. Fleming, Diabetes Program, 4201 St. Antoine, UHC-4H, Detroit, MI 48201, USA. FAX 313-745-0903.


Commentary
The goal of diabetes education is to empower patients to make informed decisions about the management of their disease. It is not surprising, therefore, that many diabetic patients who require insulin question the wisdom and need for cleaning their skin before injecting insulin. Further, locating a suitable, private place to do the injection can be difficult.

The British Diabetic Association advises against injecting insulin through clothing for the following reasons: thick clothing may prevent penetration of the syringe, contamination may occur, fibers may block the needle or be introduced under the skin, and needles will lose lubrication and become blunt. The study by Fleming and colleagues is the first study to compare injecting insulin through clothing with injecting through clean, bare skin. It is timely and relevant both for patients and for diabetes educators.

The study is well designed but small (42 patients) and of short duration (10 weeks of injections through clothing). It addresses the issues raised by the British Diabetic Association. The fact that the glycosylated hemoglobin levels did not substantially increase suggests adequate penetration and dosage of insulin. The lack of increase in leukocyte and neutrophil counts suggests that infection did not occur. The reported benefits (e.g., freedom from having to locate and use restrooms that were less than hygienic) far outweighed the problems (e.g., thick clothing, such as denim, was the source of some difficulties).

This study provides evidence for physicians and educators about something that our patients have known for some time: Injecting insulin through clothing can be done intermittently as a safe and socially acceptable alternative to injecting into clean, bare skin. It needs to be repeated, however, with a larger patient sample and for a longer period to provide unequivocal evidence of the safety and efficacy of injecting through clothing.

Tim A. Carney, MD
Burn Brae Medical Group
Hexham, England, UK

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